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Analysis of codification of terms and terminological units of the sphere of nuclear physics in modern English Tomsk Polytechnic University

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Abstract

In the modern world young scientists and specialists in the field of nuclear physics face the problem associated with the correct use of English terms and terminological units belonging to the field. Technical universities have the task to develop students' competitiveness in the specialty of nuclear physics and technology, which is expressed in the ability to correctly use terms and terminological units. This article is devoted to the analysis of the codification of terms and terminological units in the field of nuclear technology industry in modern English. The analysis has shown a number of codified and non-codified terms and terminological units of the sphere of nuclear energy.

Keywords: Term, terminological combination, neologisms, codification, English;

1. Introduction

The modern world is actively developing. Nuclear physics has been used in many areas of industry, medicine, energy, space, transport, etc. Every year the need for modern technology increases. The use of professional terms related to nuclear physics is gradually increasing. There are new items and technologies in this area, and, accordingly, there is a need to give names to them (coin new terms). New terms and terminological combinations do not immediately get into special dictionaries. At first they may appear in scientific and technical texts. And only then they are fixed in special dictionaries by experts [7]. There is an exchange of information between specialists in the field of nuclear physics and young scientists when writing scientific articles in English. Often, young scientists face the problem associated with the correct use of terms and terminological combinations in the field of nuclear physics. At present, technical colleges set themselves the task of developing students' competitiveness in the specialty of nuclear physics and technology. Competitiveness is expressed in the ability to correctly use the terms and terminological combinations in a specific professional field. In this regard, there is a need to conduct a linguistic analysis of English terms and terminological combinations of this field [8]. This article presents an analysis of the codification of English terms and terminological combinations of the sphere of nuclear physics, which allows to identify the degree of codification, i.e. vocabulary fixation of terms and terminological combinations selected from special sources (scientific and technical texts), as well as the presence of neologisms, new terms and terminological combinations that have recently come into use by specialists of this field.

1.1. Methodology

For the analysis of the codification of English terms and terminological combinations of the field of nuclear physics, several scientific articles (in the amount of 6) of this sphere have been selected. Then a selection of English terms and terminological combinations has been made. A search has been performed for selected 51 terms and terminological combinations in English-Russian and Russian-English online vocational-technical dictionaries (in the amount of 3).

1.2. Experimental

Terminus (from the Latin. Terminus - the limit, the border) - a word that is the name of some object or concept of any field of science, technology, and so on. Terminological combination - two or more words used to name an object or concept of a special area [1].

Codification - an explicit recognition of the normativeness of linguistic phenomena or facts recorded in dictionaries, grammars, the development of rules and regulations that contribute to the preservation of literary norms and their scientifically based updating [2].

Neologism - a new word or expression, as well as a new meaning of the old word [3].

The following English-Russian and Russian-English dictionaries have been used for the analysis of codification:

- English-Russian and Russian-English dictionary *Multitran* - <https://www.multitran.ru/c/m.exe?&l1=1&l2=2&CL=1&a=0>

- Oxford dictionary

<https://en.oxforddictionaries.com/>

- English technical dictionary *Perfekt*

<http://www.perfekt.ru/dictionaries/tech.html>

A selection of English terms and terminological combinations has been made from the following scientific and technical articles:

- Modern financial models of nuclear power plants - <https://www.sciencedirect.com/science/article/pii/S0149197018302385>

- Consequence analysis of a transportation accident of radioactive spent resin waste from a heavy water-cooled reactor to a the Gyeongju radioactive waste disposal facility

<https://www.sciencedirect.com/science/article/pii/S0149197018302270>

- Fluid-elastic instability evaluation for reactor vessel internals with structural interaction

<https://www.sciencedirect.com/science/article/pii/S0149197018302415>

- Superheavy nuclei from ^{48}Ca -induced reactions

Yu. Ts. Oganessian, V.K. Utyonkov

<https://www.sciencedirect.com/science/article/pii/S0375947415001517>

- Hypercentral Constituent Quark Model with a Meson Cloud

D.Y. Chen, Y.B.Dong, M.M. Giannini, E.Santopinto

<https://www.sciencedirect.com/science/article/pii/S0375947406006762#!>

- Phase transitions and symmetry energy in nuclear pasta

C.O. Dorso, G.A.Frank, J.A. Lopez

<https://www.sciencedirect.com/science/article/pii/S0375947418301271>

It has been revealed that out of 51 terms and terminological units selected from special texts, one terminological combination *Skyrme and Gogny energy density* (2%) is non-codified, i.e. not

fixed by dictionaries; other terms and terminological combinations (98%) are recorded in dictionaries (Fig. 1):

1. α -decay
2. spontaneous fission properties
3. Hypercentral Constituent Quark Model
4. Meson Cloud
5. nucleon
6. Wettability
7. Fibroblast cell adhesion
8. VUV photochemistry
9. Quasi-elastic reactions
10. complex transfer reactions
11. Multi-nucleon transfer reactions
12. Excimer laser irradiation
13. silicone foils
14. super-heavy elements
15. transuranium nuclei remain
16. heavy-ion-induced reaction
17. hot rotating nuclei
18. Quasifission
19. heavy ion fusion
20. multinucleon transfer reactions
21. α - γ and internal-conversion-electron coincidence spectroscopy
22. In-beam spectroscopy
23. spontaneous fission
24. spherical superheavy nuclei
25. Skyrme and Gogny energy density
26. Penning-trap mass spectrometry
27. Single-atom laser spectroscopy
28. Buffer-gas traps
29. radiation crosslinked poly hydrogels
30. glycidyl ethers
31. Cationic polymerization
32. electron beam thermostability
- 33. Sensitization**
34. radiation-induced chain oxidation
- 35. polymer films**
36. non-proliferation
37. nuclear liability
38. carbon dioxide
39. nuclear source
40. nuclear power plants
41. total effective dose equivalent (TEDE)
42. dispersion
43. ion exchange resins
44. resuspension exposure pathways
45. radioactive waste drums

46. cement solidification
47. the annual effective dose
48. fluid velocity
49. reactor vessel internals
50. fluid-structure interaction
51. vortex-induced vibration

2. Results

The analysis of the codification of 51 English terms and terminological combinations selected from the English scientific and technical articles in online dictionaries has been done. The degree of codification has been revealed: out of 51 English terms and terminological combinations, one terminological combination (2%) not fixed by dictionaries and, accordingly, a neologism has been found. The remaining terms and terminological combinations are codified (98%). Thus, most of the terms and terminological units of the sphere of nuclear physics are codified, which indicates the established and orderly terminological system of this area in modern English.

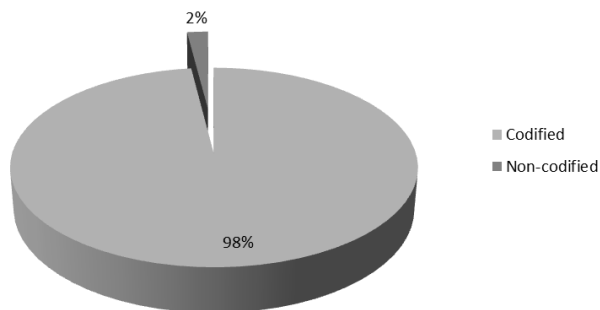


Fig. 1. The degree of codification of English terms and terminological combinations in the field of nuclear physics

3. Conclusion

On the basis of the obtained results, it can be concluded that the analysis of codification is necessary because it helps to streamline the terms and terminological units, and, accordingly, the terminological system of this sphere, as well as identify the neologisms that are formed with the development of the nuclear technology industry which is essential for successful communication of specialists in the nuclear industry.

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